



The eTrace project and experience from Icelandic pilot

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Matís is an independent research institute which strives toward innovation in the food industry, biotechnology and food security.

Matís provides consultancy and services to companies in fisheries and agriculture as well as governmental agencies.

Staff: Around 100



The eTrace project

- Two-year project in SAFEFOODERA – Topic Traceability
- Project period: April 2009-April 2010
- Participants: SINTEF, Matis, Tracetracker, ROI4U, The Swedish board of Fisheries and Lund University.

eTrace aims to specify, develop, and evaluate an electronic traceability system where different information sources related to food safety and suitable enterprise management systems are integrated with EPCIS . The purpose of this system is to provide efficient traceability operations in food supply chains.



http://www.tracefood.org/index.php/International:SAFEFOODERA_eTrace

Swedish pilot

- Chain traceability
- Day-boats
- “Manual” processing



Icelandic pilot

- Internal traceability
- Trawlers
- “Automatic” processing



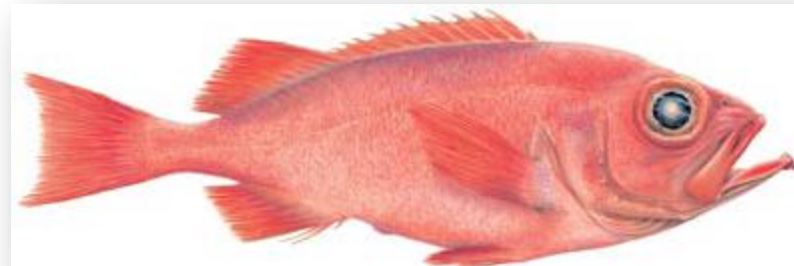
- **HB Grandi manages the largest share of quotas in the ocean around Iceland.**
- **3 processing plants**
- **670 employees**



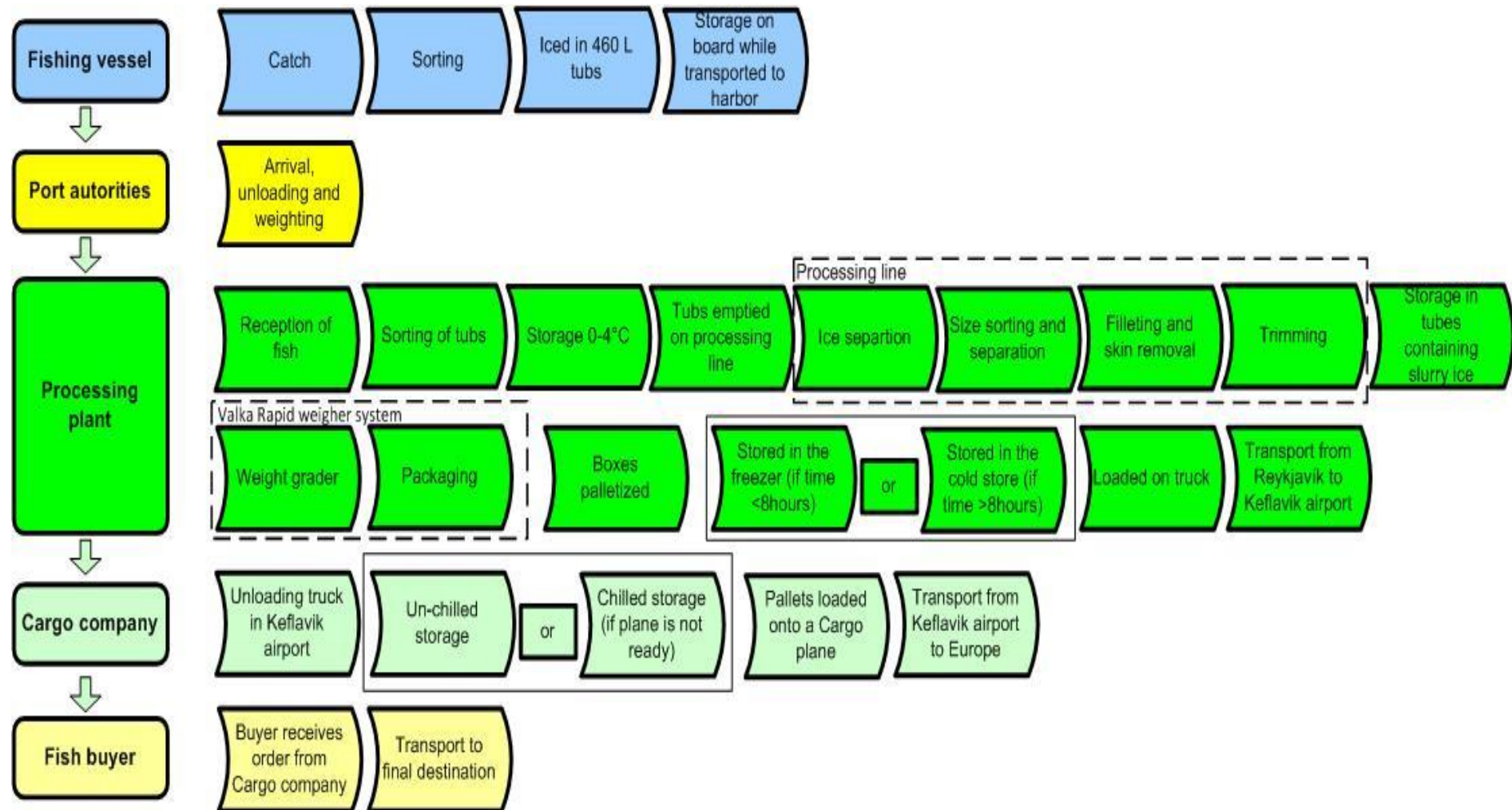
HB Grandi processing plant in Reykjavik.

- Deep sea redfish is found west, south and east of the country and most oceanic redfish is caught off the Reykjanes Ridge southwest of Iceland.
- In the wetfish trawlers the catch is iced in tubs and kept chilled.
- The fish is then processed on land in the company's plant where it is size-graded, headed and filleted by machine.
- The fillets are then trimmed and stored in slurry ice.
- Finally, the fillets are either IQF frozen or packed chilled and airlifted the same day to the European market.

*Djúpkarfi, Úthafskarfi • Gallineta nórdica
Sébaste du nord • Tiefsee Rotbarsch
Dybhavsrødfisk • Morskoi okun' • Shinkai Akauo*



The process



Existing traceability problems at HB Grandi and how to improve upon

Existing problem	How to improve:
Coarser granularity than wanted, resulted in complex catch certificates	<ol style="list-style-type: none"> 1. Tubs need their own identifiers 2a. Each new boat starts with empty production tubs 2b. Keep track of mixed production tubs 3. Documentation of mixed fillet EPS boxes
A lot of manual counting (5 times) of EPC boxes	<ol style="list-style-type: none"> 1. Serialized numbers on labels on production boxes 2. Read labels when boxes are added or removed from pallets 3. Pallet number should be connected to serial numbers
No easy access for traceability information	<ol style="list-style-type: none"> 1. All different internal systems have to share information to traceability system by using the EPCIS standard

EPC Events answer 4 questions

What, Where, When, and Why

- The EPCIS standard defines a schema for physical visibility data, and interfaces for the capture and query of this data.
- The EPCIS events cover normal logistic and stock control processes by the use of the Event classes.

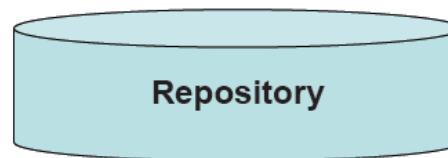
Event Type	Object Event
Event Fields	Timestamps
	Action
	EPCList
	bizStep
	bizLocation
	readPoint
	Disposition
	bizTransaction

Event Type	Quantity Event
Event Fields	Timestamps
	EPCClass
	Quantity
	bizStep
	bizLocation
	readPoint
	Disposition
	bizTransaction

EPCIS Query Interface



Event Type	Aggregation Event
Event Fields	Timestamps
	Action
	ParentID
	ChildEPCList
	bizStep
	bizLocation
	readPoint
	Disposition
	bizTransaction

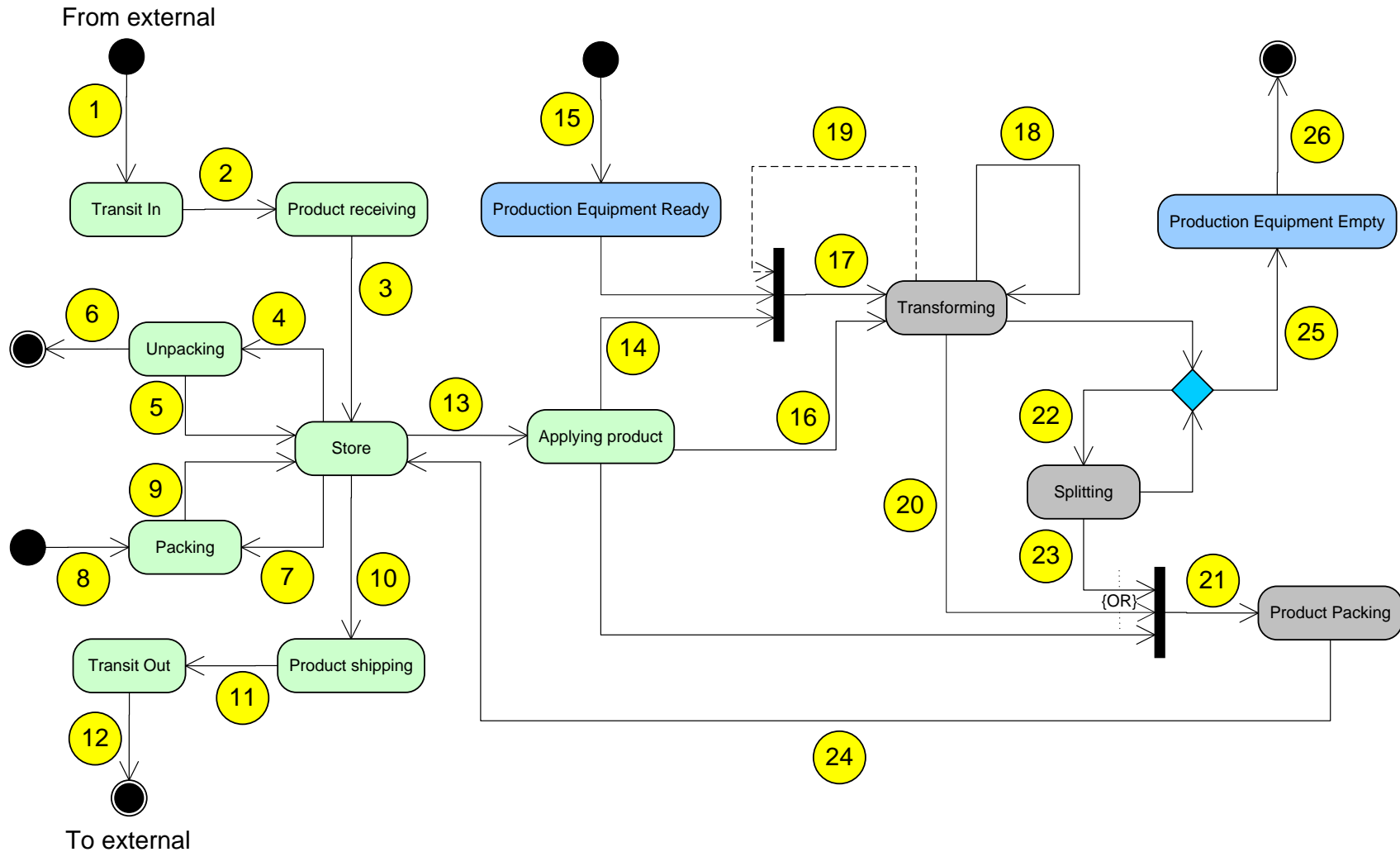


EPCIS Capture Interface



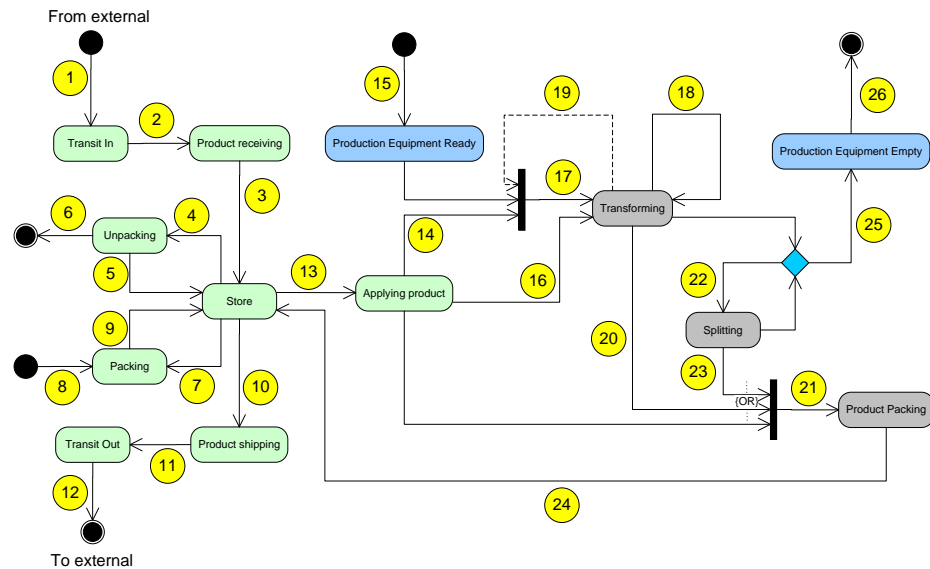
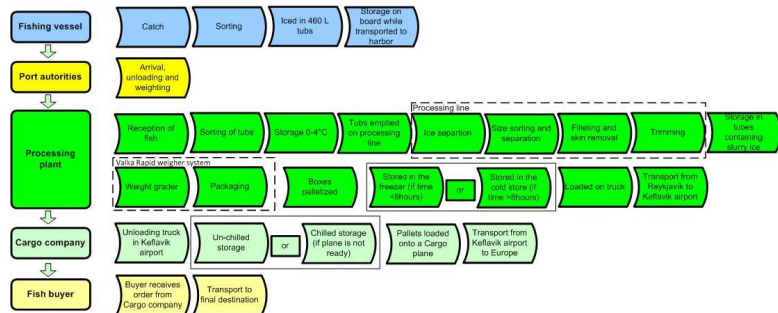
Event Type	Transaction Event
Event Fields	Timestamps
	Action
	ParentID
	EPCList
	bizStep
	bizLocation
	readPoint
	Disposition
	bizTransaction

Generic traceability events in production and processing

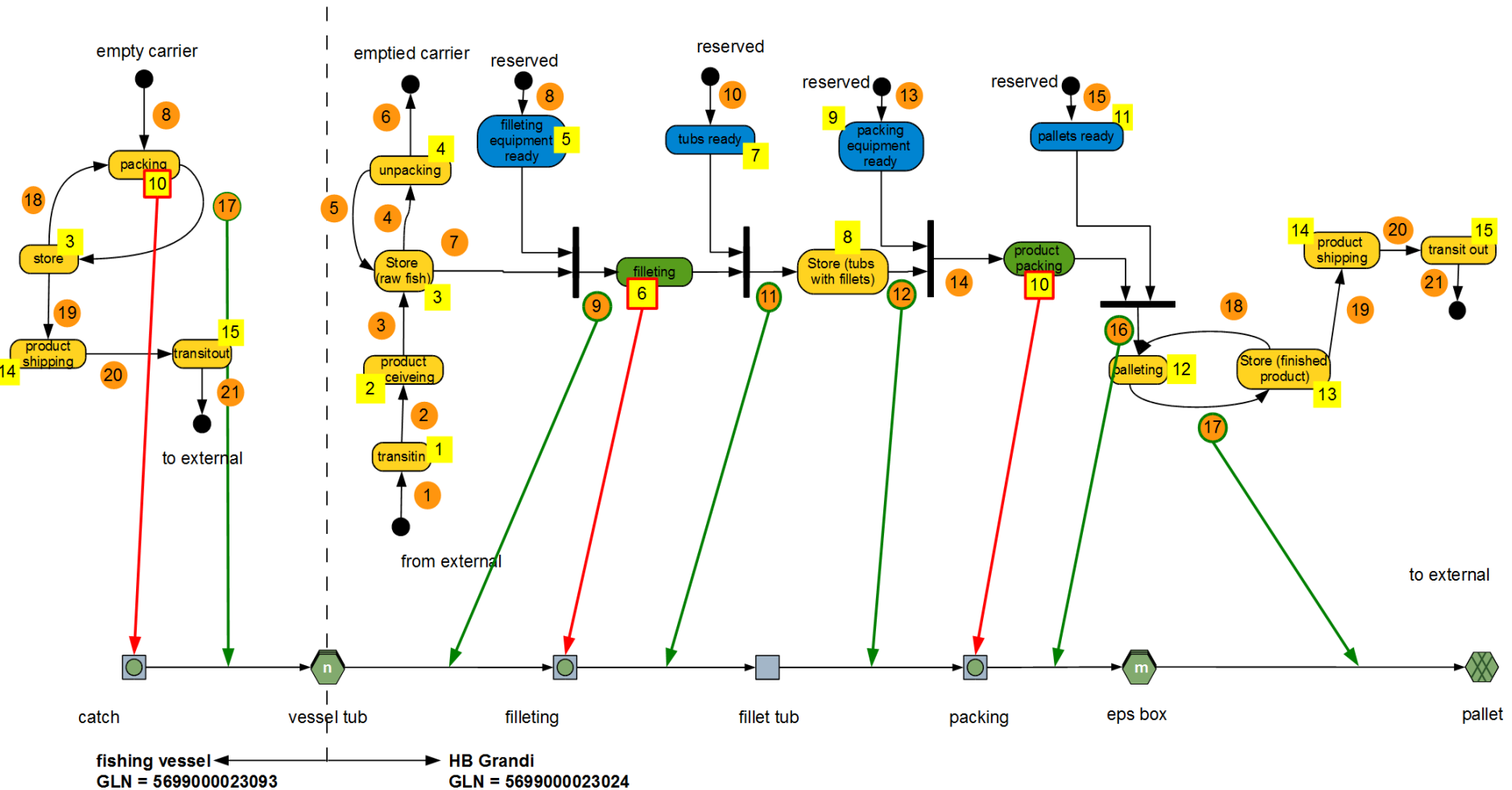


The application of the EPCIS standard for food traceability purposes was tested in this project. The approach used is based on identification of states and events in food production and mapping these events to the EPCIS standard.

Model traceability information using the EPCIS framework and UML statecharts



Relationship between the traceability model for HB Grandi redfish catching and processing, and the underlying eTrace event model

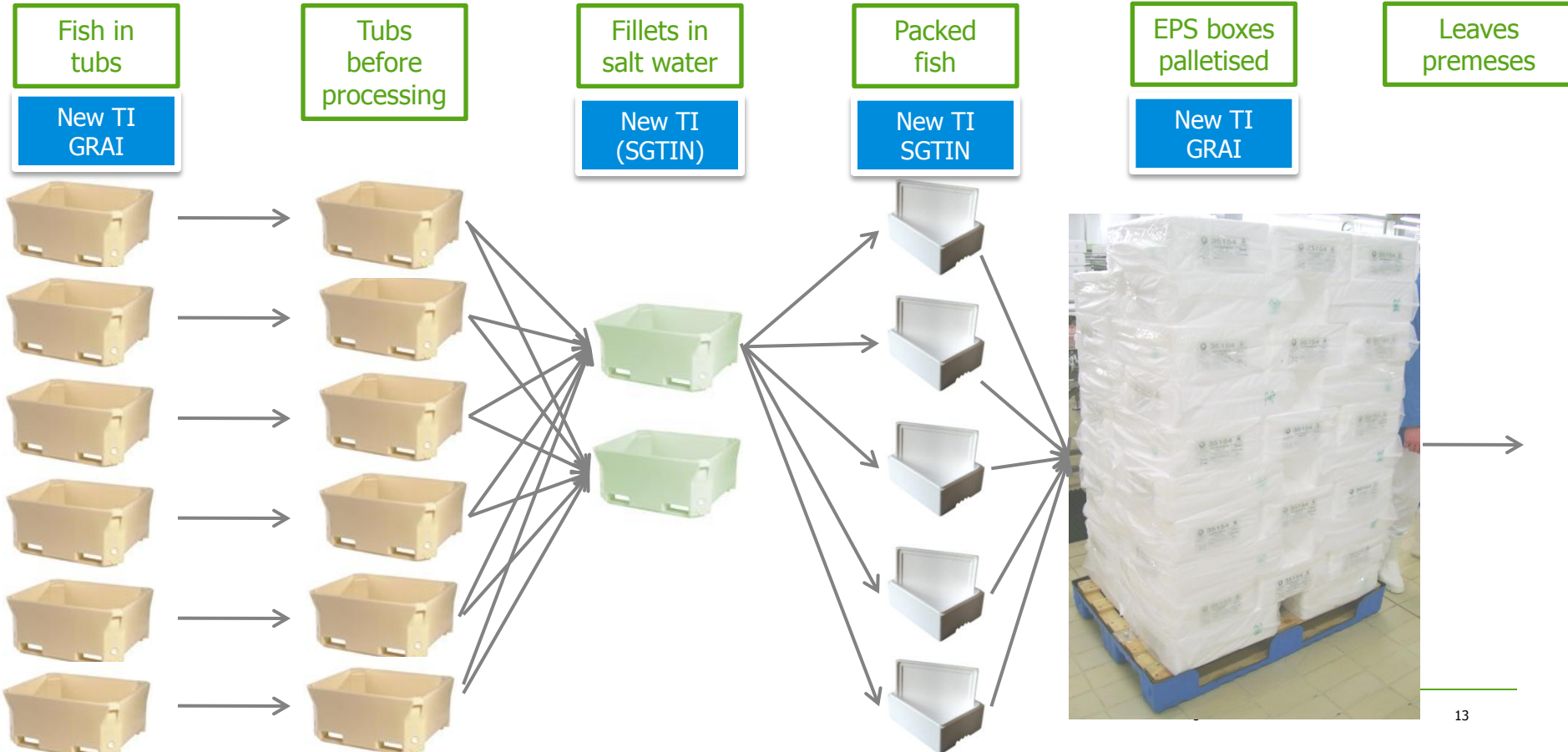


The process

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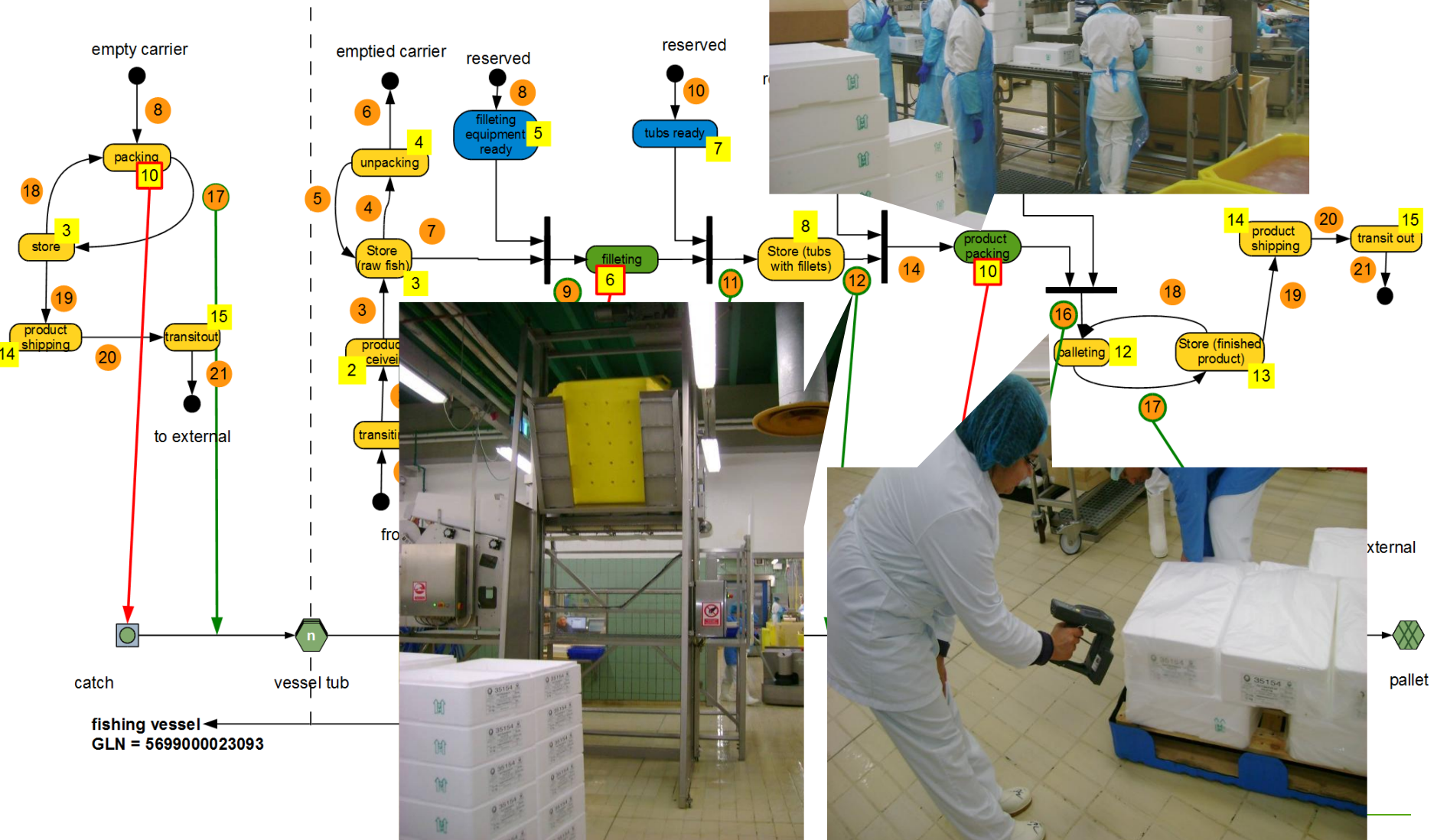
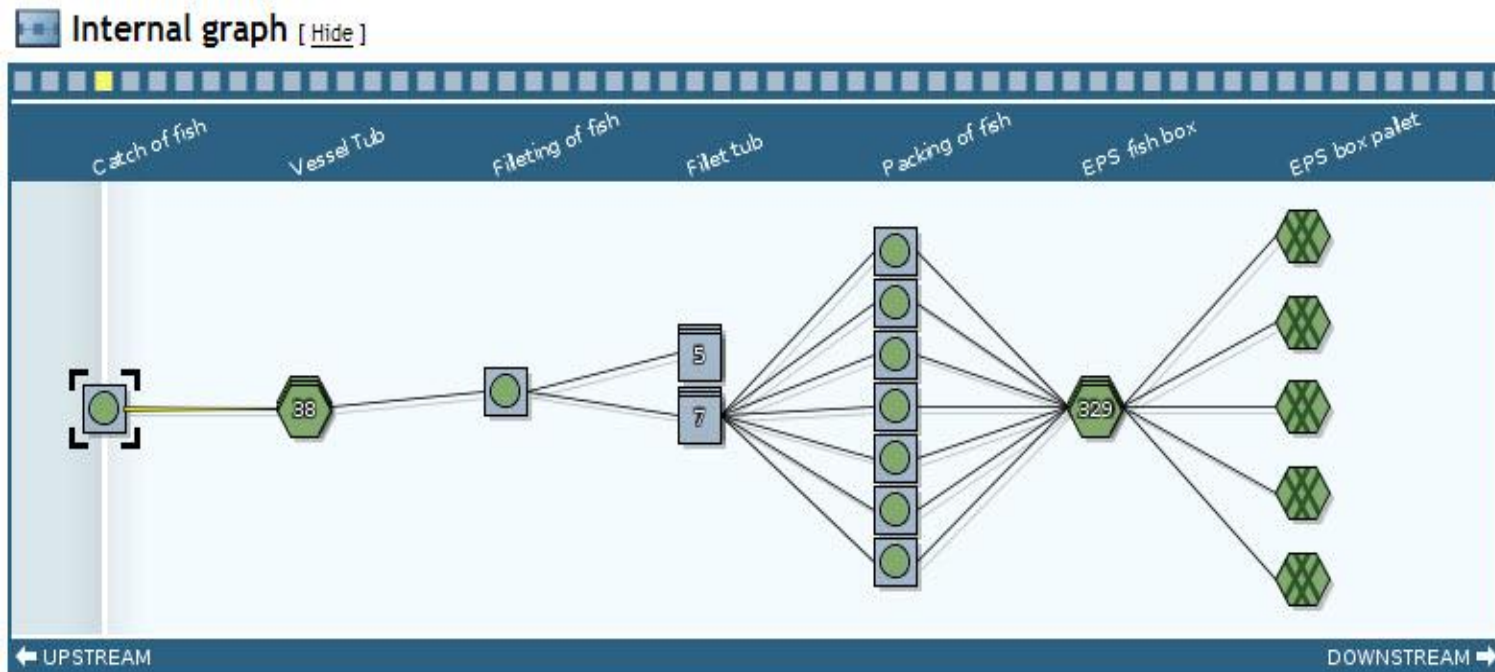


Figure shows one fishing day which resulted in 38 vessel tubs of iced redfish, modeled as one catch to simplify internal traceability.



etrace
ec=te8rfid

This system and the EPCIS standard makes it possible to associate other relevant information with the tagged item or event in the process itself.

EPCIS-based traceability systems performed well in this pilot

- **improved internal traceability presentation to other stakeholders in the value chain.**

TraceTracker repository:

- **user-friendly for managers, and other stakeholders in this chain by providing a simple diagrams**
- **inventory overview**
- **software was able to connect events and thus identifiers together**

Readability of tags

- In the first stage of the pilot where 38 tubs were labelled with GRAI RFID, 4 tags did not work and were replaced.
- No such problems were detected with the SGTIN tags
- No tags lost its readability during the pilot

Hardware

- There were problems reading temperature sensors with Nordic hand scanners
- Sometimes the hand scanners had problems sending data wirelessly, due to software coding



How soon is now...

HB Grandi saw potential:

- **this RFID EPCIS traceability system enables finer granularity**
- **simpler catch certificates.**
- **increased information flow through the value chain**
- **gateway for customers to access products information**
- **opportunities for better processing control of products and even greater efficiency opens**
- **increased automation in the processing of fish**

The future...

- **Tubs with fixed RFID**
- **Automatic reading stations in processing plants**
 - **may provide a faster and more efficient way of information capture and exchange**
 - **reduce manpower needed**

- **Efficient information capture and exchange by using the EPCIS standard**
- **Better information visibility in fish supply chain - leads to increased sales**
- **EPCIS traceability system enables finer granularity than is usually available in the fishing industry**
- **EPCIS is applicable for food traceability and thus international trade**



